Remarks

I. Introduction

This is in response to the Office Action dated September 25, 2007. The Office Action objected to claims 1-11 because of informalities. The Office Action also rejected claims 1, 5-7, 9, 10, 12 and 17 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. The Office Action also rejected claims 1, 3-6, 8-13, and 15-19 under 35 U.S.C. §102(b) as being anticipated by WO 02/25402 (Donaghey), under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Publication No. 2004/0250124 (Chesla), and also under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Publication No. 2003/0172145 (Nguyen). The Office Action additionally rejected claims 2, 7, and 14 under 35 U.S.C. §103(a) as being unpatentable over Donaghey in view of "Official Notice", over Chesla in view of "Official Notice", and over Nguyen in view of "Official Notice".

In response to the objections to claims 1-11, Applicants amend claims 1, 6, and 7. In response to the §112 rejections, Applicants amend claims 1, 5-7, 9, 10 and 17. Applicants traverse the §102 and §103 rejections. Claims 1-19 are pending.

II. Objections to Claims Due to Informalities

The Office Action objected to claims 1-11 because of informalities, stating that "'adapted to' should be replaced with a gerund in order to make the limitation more positive for examination." Applicants respectfully disagree and submit that "adapted to" (as well as "configured to") is proper claim language for an apparatus claim. Applicants respectfully submit that replacing "adapted to" or "configured to" with a gerund may be appropriate for a method claim, but is not appropriate since the claim is an apparatus claim. To expedite prosecution, however, Applicants have amended claims 1, 6, and 7 by replacing "adapted to" with "configured to". No new matter has been added.

III. Rejections under 35 U.S.C. §112

The Office Action also rejected claims 1, 5-7, 9, 10, 12 and 17 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicants have amended claims 1, 5-7, 9, 10 and 17 in response to the §112 rejections. No new matter has been added.

Dependent claim 12 was rejected because "the terms 'black-holing', 'non-black-holing' ... is a relative term, which renders the claim indefinite. It is not apparent, as per the claimed invention, distinction of black-holing versus non-black-holing for the routers." (Office Action, page 3).

Applicants respectfully disagree. Dependent claim 12 claims, in part:

> responding to said instruction, by a plurality of routers within said ISP network, such that a first number of routers become black-holing routers and a second number of routers become non-black-holing routers.

Applicants respectfully submit that it is clear that "black-holing routers" are one type of router and "non-black-holing routers" are another type of router. "Black-holing routers" and "non-black-holing routers" are specifically defined in the Specification on page 11, lines 9-11 as follows:

> A black-holing router is a router that installs the black-hole route to router 22 into its routing table and a non-black-holing router is a router that installs the original route to the system-under-attack's IP address into its routing table.

Applicants respectfully submit that dependent claim 12 is definite as the meaning of the terms "black-holing" and "non-black-holing" is clear from the description, and that the claim satisfies all requirements of 35 U.S.C. §112. As a result, Applicants request removal of the 35 U.S.C. §112 rejections.

IV. Rejections under 35 U.S.C. §102

The Office Action also rejected claims 1, 3-6, 8-13, and 15-19 under 35 U.S.C. §102(b) as being anticipated by WO 02/25402 (Donaghey), under 35

U.S.C. §102(e) as being anticipated by U.S. Patent Publication No. 2004/0250124 (Chesla), and also under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Publication No. 2003/0172145 (Nguyen).

In order for a claim to be anticipated under 35 U.S.C. §102, **each and every** limitation of the claim must be found either expressly or inherently in a single prior art reference. PIN/NIP, Inc. v. Platte Chem. Co., 304 F.3d 1235, 1243 (Fed. Cir. 2002). In the present case, neither Donaghey, Chesla, nor Nguyen shows each and every limitation of claims 1, 3-6, 8-13, and 15-19. Therefore, Applicants request the withdrawal of the rejections under 35 U.S.C. §102.

The present invention relates to selectively black-holing attack traffic so that some of the traffic destined for an IP address under a DDoS attack continues to go to the IP address under attack while other traffic, destined for the same IP address, is rerouted via BGP sessions to a black-hole router. Such a selective black-holing scheme can be used to allow some traffic to continue in route to the IP address under attack, while other traffic is diverted.

Donaghey

Amended independent claim 1 claims, in part:

> a black-hole router in communication with said plurality of routers, said black-hole router configured to have a bogus IP address that is same as said first IP address, said bogus IP address having a preference higher than a preference for said first IP address.

Donaghey does not disclose this limitation. Briefly, Donaghey discloses a system that protects communication networks and devices against denial of service (DoS) attacks. A service provider receives a signal indicating that a DoS attack has been detected, receives one or more packets intended for a victim device, and transmits the one or more packets to a triage device. The triage device determines whether each of the one or more packets is part of the DoS attack and forwards only packets that are deemed unrelated to the DoS attack to the victim device. (Abstract).

The Office Action states that Donaghey discloses the above limitation on page 4. Page 4 of Donaghey discloses a triage device which receives one or more packets and determines whether each of the one or more packets is part of a denial of service attack. If the packet is part of the DoS attack, the triage device may discard the packet. If the packet is not part of the DoS attack, the triage device forwards the packet to a target device. Even if the Examiner considers Donaghey's triage device as a black-hole router, page 4 of Donaghey does not disclose the IP address of Donaghey's triage device being the same as another router. Furthermore, page 4 of Donaghey does not disclose the address of Donaghey's triage device having a preference higher than a preference for the IP address of another router.

Amended independent claim 1 also claims, in part:

> wherein either one of said plurality of routers or said black-hole router is configured to inject a black-hole route scheme into a dynamic routing protocol used by said ISP network such that selected ones of said plurality of routers route traffic to said bogus address of said black-hole router.

Donaghey does not disclose this limitation either. The Office Action states that Donaghey discloses this limitation on page 7 of Donaghey. Page 7 of Donaghey discloses its network traffic being routed through the triage device when a DoS attack has been detected. (Donaghey, lines 17-19). Page 7 of Donaghey does not, however, disclose the selective routing of traffic to a black-hole router. Specifically, Donaghey does not disclose "selected ones of said plurality of routers route traffic to said bogus address of said black-hole router," (emphasis added) as claimed in amended independent claim 1. Instead, Donaghey discloses that all traffic goes through the triage device when a DoS attack has been detected and the triage device itself determines whether to forward each packet to the target device. Thus, Donaghey's triage device is another stop for each packet before reaching Donaghey's target device. This is different than amended independent claim 1 because amended independent claim 1

claims that selected routers route traffic to the "bogus address of said black-hole router." Thus, instead of all traffic going to Applicants' black-hole router, only some of the traffic (associated with the selected routers) gets transmitted to Applicants' black-hole router.

Additionally, Applicants respectfully request that, if the Examiner persists with these rejections, the Examiner specifically cite the particular line numbers of Donaghey that the Examiner believes discloses the cited claim limitation instead of just the page numbers so that Applicants can fully respond to this rejection.

Chesla

Chesla also does not disclose the limitations claimed in amended independent claim 1. As stated above, amended independent claim 1 claims, in part:

> a black-hole router in communication with said plurality of routers, said black-hole router configured to have a bogus IP address that is same as said first IP address, said bogus IP address having a preference higher than a preference for said first IP address.

Briefly, Chesla discloses a method for protecting a network from an attack by measuring a property of traffic entering the network, and analyzing the property using at least one fuzzy logic algorithm in order to detect the attack. (Abstract). The Office Action states that Chesla discloses the above limitation on page 4. Applicants respectfully disagree. Page 4 of Chesla discloses a variety of subject matters, as it is part of Chesla's Summary of the Invention.

Paragraphs [0050] through [0052] of Chesla, along with the rest of Chesla's page 4, are directed to applying fuzzy logic to a characteristic or property of traffic. Page 4 of Chesla does not, however, disclose an IP address of one of Chesla's routers being the same as another router. Furthermore, page 4 of Chesla does not disclose the address of one

router having a higher preference relative to the preference of a second router, as claimed in amended claim 1.

As stated above, amended independent claim 1 also claims, in part:

> wherein either one of said plurality of routers or said black-hole router is configured to inject a black-hole route scheme into a dynamic routing protocol used by said ISP network such that selected ones of said plurality of routers route traffic to said bogus address of said black-hole router.

Chesla does not disclose this limitation either. The Office Action states that Chesla discloses this limitation on page 4 of Chesla. Page 4 of Chesla does not disclose the selective routing of traffic to a black-hole router. Specifically (and like Donaghey), Chesla does not disclose "selected ones of said plurality of routers route traffic to said bogus address of said black-hole router," (emphasis added) as claimed in amended independent claim 1.

Additionally, Applicants respectfully request that, if the Examiner persists with these rejections, the Examiner specifically cite the particular paragraph(s) of Chesla that the Examiner believes discloses the cited claim limitation instead of just the page numbers so that Applicants can fully respond to this rejection.

Nguyen

Nguyen also does not disclose the limitations claimed in amended independent claim 1. As stated above, amended independent claim 1 claims, in part:

> a black-hole router in communication with said plurality of routers, said black-hole router configured to have a bogus IP address that is same as said first IP address, said bogus IP address having a preference higher than a preference for said first IP address.

Nguyen discloses a system and method for developing and implementing ISP architectures. One embodiment of a method for designing and implementing ISP architectures may include formulating a

set of design requirements for an ISP architecture, establishing an architectural model for the ISP architecture using the set of design requirements, generating a logical design for the ISP architecture from the architectural model and the set of design requirements, and generating a physical design for the ISP architecture using the architectural model and the logical design. One embodiment may also include selecting one or more components of the ISP architecture and implementing the ISP architecture according to the logical design and the physical design. In one embodiment the system and method for designing, developing and implementing ISP architectures may be used to design, develop and implement an N-tiered ISP architecture. (Abstract).

The Office Action states that Nguyen discloses the above limitation at page 6 of Nguyen. Page 6 of Nguyen, however, does not disclose the above limitation. Specifically, page 6 of Nguyen is part of the Brief Description of the Drawings section and is directed to a variety of subject matters.

Nguyen also does not disclose the limitation of:

> wherein either one of said plurality of routers or said black-hole router is configured to inject a black-hole route scheme into a dynamic routing protocol used by said ISP network such that selected ones of said plurality of routers route traffic to said bogus address of said black-hole router.

as claimed in amended independent claim 1. The Office Action states that Nguyen discloses this limitation at page 7. Page 7 of Nguyen includes paragraphs about "Designing, Developing, and Implementing ISP Architectures". Page 7 of Nguyen does not, however, disclose the above limitation. Applicants respectfully request that, if the Examiner persists with these rejections, the Examiner specifically cite the particular paragraph(s) of Nguyen that the Examiner believes discloses the cited claim limitation instead of just the page numbers so that Applicants can fully respond to this rejection.

Independent claims 6 and 12 contain limitations that are similar to the limitations claimed in amended independent claim 1 and are allowable for the reasons described above.

All remaining claims are dependent upon an allowable independent claim and are therefore also allowable. Dependent claims 5 and 16 are also allowable for at least the following additional reasons.

Dependent claims 5 and 16 relate to changing the selected ones of the plurality of routers in real-time by injecting a new black-hole route scheme into the dynamic routing protocol. The Office Action states that Donaghey discloses this limitation at page 7 and page 9. These pages of Donaghey disclose routing packets through Donaghey's triage device but do not disclose this limitation. The Office Action states that Chesla discloses this limitation on page 4 and page 6. Neither of these pages of Chesla, however, disclose the limitation claimed in dependent claims 5 and 16. The Office Action also states that Nguyen discloses this limitation at page 7. Page 7 of Nguyen does not disclose this limitation. As a result, dependent claims 5 and 16 are allowable over Donaghey, over Chesla, and over Nguyen.

VI. Conclusion

For the reasons discussed above, all pending claims are allowable over the cited art. Reconsideration and allowance of all claims is respectfully requested.

Respectfully submitted,

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